Claims

1. A method of depositing a coating comprising a first material and a second material on a substrate, wherein the first material comprises ta-C, the method comprising:

i) depositing the first material via a CVA process to form a lower layer;

ii) simultaneously depositing the first material via the CVA process and the second material via a sputtering process to form a transition layer; and

iii) depositing the second material via a sputtering process to form an upper layer.

2. A method of depositing a coating comprising a first material and a second material on a substrate, wherein the first material comprises ta-C, the method comprising:

i) depositing the second material via a sputtering process to form a lower layer;

ii) simultaneously depositing the first material via the CVA process and the second material via a sputtering process to form a transition layer; and

iii) depositing the first material via a CVA process to form an upper layer.

3. A method according to claim 1 or claim 2, wherein the CVA process is FCVA.

4. A method according to any of claims 1 to 3, wherein the first material consists of ta-C.

5. A method according to any of claims 1 to 4, wherein the second material is selected from Ti, Cr, Si, Zr, C, W and alloys and compounds thereof.

6. A method according to any of claims 1 to 5, further comprising depositing a seed layer onto the substrate prior to coating the lower layer.

7. A method according to claim 6 wherein the seed layer has a thickness of from 0.1µm to 0.5µm.

8. A method according to any one of claims 1 to 7, wherein the substrate is a metallic substrate.

9. A method according to claim 8 wherein the substrate is a steel substrate.

10. A method according to claim 1 or any claim dependent thereon wherein the lower layer deposited by CVA has a thickness of 0.2µm to 1.5µm.

11. A method according to claim 2 or any claim dependent thereon wherein the upper layer deposited by CVA has a thickness of 0.2µm to 1.5µm.

12. A method according to claim 1 or any claim dependent thereon wherein the upper layer deposited by sputtering has a thickness of 0.1µm to 0.5µm.

13. A method according to claim 2 or any claim dependent thereon wherein the lower layer deposited by sputtering has a thickness of 0.1µm to 0.5µm.

14. A method according to any of claims 1 to 13 wherein the coating has a thickness of from 0.5µm to 5µm.

15. A method according to claim 14 wherein the coating has a thickness of from 1.0µm to 3.0µm.

16. A method according to any of claims 1 to 15 wherein the coating takes place in a chamber at a pressure of 0.5 Pa or less.

17. A substrate coated with a coating, wherein the coating comprises:

i) a layer of a material deposited via a sputtering process;

ii) a transition layer between (i) and (iii) deposited by a process comprising simultaneous CVA deposition of ta-C and sputtering of the material; and

iii) a ta-C layer deposited by CVA deposition.

18. A substrate coated with a coating according to claim 17, wherein the coating comprises the following layers deposited in order on the substrate;

i) a ta-C layer deposited by CVA deposition;

ii) a transition layer between (i) and (iii) deposited by a process comprising simultaneous CVA deposition of ta-C and sputtering of the material; and

iii) a layer of the material deposited via a sputtering process.